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persistently transported to the equatorial plane of the corona; in fact, the zodiacal light may be the accumulation at great distances from the sun along this equator of such like material. Photographs on a larger scale will be desirable for the full development of the conclusions which may follow from this study of the curved forms of the coronal structure. Professor Schaeberle, however, considers that the coronal phenomena may be satisfactorily accounted for on the supposition that the corona is formed of streams of matter ejected mainly from the spot zones with great initial velocities, but smaller than 382 miles per second; further, that the different types of the corona are due to the effects of perspective on the streams from the earth's place at the time relatively to the plane of the solar equator.

Of the physical and the chemical nature of the coronal matter we know very little. Schuster concludes, from an examination of the eclipses of 1882, 1883, and 1886, that the continuous spectrum of the corona has the maximum of actinic intensity displaced considerably towards the red when compared with the spectrum of the sun, which shows that it can only be due in small part to solar light scattered by small particles. The lines of calcium and of hydrogen do not appear to form part of the normal spectrum of the corona. The green coronal line has no known representative in terrestrial substances, nor has Schuster been able to recognize any of our elements in the other lines of the corona.

(To be continued.)

#### NOTES AND NEWS.

RECENT additions to the stock of Geo. L. English & Co., the well-known mineralogists, have been so extensive that they have been compelled to issue a supplement to their "Catalogue of Minerals." "Supplement A" contains 20 pages well filled with descriptions of new specimens procured in different parts of the world by the three collectors who have been at work during the summer.

—"As I went to the train one morning," writes a correspondent of *Nature*, "I saw a brown retriever dog coming full speed with a letter in his mouth. He went straight to the mural letter box. The postman had just cleared the box, and was about twenty or thirty yards off when the dog arrived. Seeing him, the sagacious animal went after him, and had the letter transferred to the bag. He then walked home quietly."

—Dr. Loewenberg of Paris discusses the influence of sex in what he calls the "lateralization" of ear disease. After referring to the view generally held by otologists that the left ear is more liable to be attacked alone, or to be attacked first and to suffer more severely when both ears are affected, he says, according to the *British Medical Journal*, that he has for a long time past been struck with the fact that, while deafness is more common on the left side in men, the same does not hold good in the case of women. From statistics of 3,000 cases (not including diseases of the concha and external meatus) which have come under his own notice, he shows, in the first place, that the male sex is more subject to ear disease than the female, there having been 1,790 of the former to 1,210 of the latter. Among those in whom only one ear was affected there were 478 men and 311 women. The right ear alone was affected in 212 men and 167 women; the left alone in 266 men and 144 women. Deafness existed in both ears in 1,074 men and 737 women. Among this number the right ear was the more deaf of the two in 427 men and 340 women, the left in 647 men and 397 women. Deafness was equal on both sides in 238 men and 162 women.

—The Ohio State University opened the fall term on Sept. 16, with a more than usual increase of attendance. In the agricultural and veterinary departments the number is over thirty per cent larger than last year, and the increase of the various departments together is much larger than any previous year. This is

probably due to the passage of the Hysell bill last year, which brought the institution before the minds of the people, and also put it beyond financial embarrassment. In addition to the nine buildings now in use, the ground will be broken this fall for two more large buildings,—one for the manual training school and the other for the museum and library. Several full professors have been added to the faculty, besides a number of assistants. The School of Law, which is a new department, opened its first session on Oct. 1, at the Franklin County Court House in Columbus, where students will have unusual facilities for observing the organization and working of courts, the actual progress of trials, etc. The new school starts out in a way that promises prosperity. The biological club held its first meeting of the term on Sept. 22, when interesting reports of the summer's work were submitted by the members. Several new members were elected, among them W. A. Kellerman, professor of botany in the university, and Professor F. M. Webster, entomologist at the Experiment Station. Both are valuable acquisitions to the club, each having travelled and done biological work both at home and abroad.

—The monthly report of the State Geologist of Missouri states that during September detailed mapping has been continued in Henry and St. Francois counties, and, in the former, most excellent progress has been made. In all, some one hundred and fifteen square miles have been covered. The mapping of the crystalline rocks in the south-east, and of the other geological formations in Webster, Greene, and Christian Counties has been actively pushed, and nearly two hundred square miles have been completed during the month. Inspections of iron ore deposits have been made in Reynolds, Texas, Wright, Douglas, Christian, Taney, Greene, Lawrence, Franklin, Gasconade, Howell, Jasper, and Laclede Counties. The results of this work so far indicate that the extent of the limonite ores of the southern part of the State is much greater than has been anticipated, and that there is a promising outlook for the development of manganese ores in this region. Inspections of lead and zinc deposits have been made in Polk, Dade, Taney, Laclede, Phelps, Douglas, Marion, and Franklin Counties. The quaternary deposits have been studied in Cape Girardeau, St. Louis, Franklin, Marion, Pike, Lincoln, St. Charles, Livingston, Chariton, Daviess, and Buchanan Counties. Good progress has been made in the preparation of the report on the paleontology of the State. Some two hundred and forty pages of manuscript are already written, and arrangements are about completed for the engraving of the plates to accompany the volume. The preliminary reports on the coal deposits of the State is nearly completed, and much time has been spent during the past month on the preparation of the manuscript and illustrations for it, and the draughting of detailed maps and sections preparatory to engraving has continued uninterruptedly.

—Queen & Co., Philadelphia, will, in a short time, transfer their entire plant, now located at 924 Chestnut Street, to the larger building, 1010 Chestnut Street. The public of Philadelphia speak of Queen's as "opticians," and comparatively few outside of the professional world are aware of the magnitude of their business. A brief description of each department may be of interest. Department No. 1 is devoted to spectacles, eye-glasses, opera glasses, field and marine glasses, and apparatus for oculists, including ophthalmoscopes, trial glasses, perimeters, etc. Department No. 2 is devoted to instruments of precision required by engineers, architects, draughtsmen, students, and others. No. 3 is for microscopes and all instruments which are allied to the microscope. From this department comes the *Microscopical Bulletin*. No. 4 is one of the most extensive and interesting. Here are to be found the various apparatus required in the physical laboratories of schools and colleges. No. 5 is devoted to magic lanterns, or, in scientific terms, apparatus for luminous projection, views, and accessory apparatus. Spy-glasses, astronomical telescopes, and solar transits are also included. No. 6 includes meteorological instruments. This department recently supplied the United States War Department with the Boulange chronographs for determining the velocity of projectiles. No. 7 is the photographic department. Every effort will be made to have this department attractive in the new building. Dark rooms for developing, etc., will be provided, and com-

petent instructors will be on hand to show the would-be photographer "how to do it." This department gives especial attention to the photographing of buildings, country seats, vessels, machinery, and to the developing and printing of exposures made by amateurs and others. In addition to these departments, Queen & Co. operate three factories and a brass foundry. Their largest factory is devoted to the manufacture of the various instruments of precision. Another factory is for the manufacture of thermometers only. The optical factory is for the manufacture of spectacles, eye-glasses, lenses, etc. They employ in the neighborhood of two hundred hands in the various departments of their business.

— Three letters from Alexander Agassiz, published in the Bulletin of the Museum of Comparative Zoology, give some interesting particulars of the expedition of the "Albatross." The deep-sea fauna in the neighborhood of Panama is poor compared to that of the eastern shores of the continent. Probably this poverty is due to the absence of a great oceanic current, bringing supplies of food. West Indian forms preponderate. The southern slope of the Galapagos also did not yield the rich fauna that was expected, though it lies in the track of a great current from the south. A gigantic ostracod, more than an inch long, was dredged up between Cape San Francisco and the Galapagos and also in the Gulf of California.

— Mr. John Bogart, State Engineer of New York, has sent in a report concerning the recession of Niagara Falls. In 1842 Professor James Hall made an accurate survey, and a comparison of his results with those of 1890, made in a bulletin of the American Geographical Society, shows that the annual recession at the American Fall has been 7.68 inches, and at the Canadian, or Horse-shoe Fall, 2 feet 2.16 inches. During this period the crest line of the American Fall has sunk from 1,080 to 1,060 feet, and that of the Canadian has risen from 2,260 to 3,010 feet. The area of rock which has been carried away during those forty-eight years is 32,900 square feet at the American Fall and 275,400 square feet at the Canadian Fall.

— Sparrows do not seem to lose in New Zealand any of the audacity for which they are famous in Europe, says *Nature*. In a paper read some time ago before the New Zealand Institute, and now printed in the *Transactions*, Mr. T. W. Kirk gives an example of what he calls their "daring and cool impudence." Between Featherston and Martinborough he heard one day a most unusual noise, as though all the small birds in the country had joined in one grand quarrel. Looking up, he saw a large hawk (*C. Gouldi*—a carrion-feeder) being buffeted by a flock of sparrows. They kept dashing at him in scores, and from all points at once. The unfortunate hawk was quite powerless; indeed, he seemed to have no heart left, for he did not attempt to retaliate, and his defence was of the feeblest. At last, approaching some scrub, he made a rush indicative of a forlorn hope, gained the shelter, and there remained. Mr. Kirk watched for fully half an hour, but he did not reappear. The sparrows congregated in groups about the bushes, keeping up a constant chattering and noise, evidently on the look-out for the enemy, and congratulating themselves upon having secured a victory.

— Some interesting observations relating to the surgical treatment of wounds by birds were recently brought by M. Fatio before the Physical Society of Geneva. According to the *Medical Record*, he quoted the case of the snipe, which he had often observed engaged in repairing damages. With its beak and feathers it makes a very creditable dressing, applying plasters to bleeding wounds, and even securing a broken limb by means of a stout ligature. On one occasion he killed a snipe which had on the chest a large dressing composed of down taken from other parts of the body and securely fixed to the wound by the coagulated blood. Twice he had brought home snipe with interwoven feathers strapped on to the site of fracture of one or other limb. The most interesting example was that of a snipe both of whose legs he had unfortunately broken by a misdirected shot. He recovered the animal only on the day following, and he then found that the poor bird had contrived to apply dressings and a sort of splint to both limbs. In carrying out this operation some feathers had become entangled

around the beak, and not being able to use its claws to get rid of them, it was almost dead from hunger when discovered. In a case recorded by M. Magnin, a snipe which was observed to fly away with a broken leg was subsequently found to have forced the fragments into a parallel position, the upper fragments reaching to the knee, and secured them there by means of a strong band of feathers and moss intermingled. The observers were particularly struck by the application of a ligature of a kind of flat-leaved grass wound round the limb, of a spiral form, and fixed by means of a sort of glue.

— There are three electrolytic processes now in commercial operation for the production of aluminum. These, as described in *Engineering*, are the Hall process, worked by the Pittsburg Reduction Company; the Heroult process, worked by the Aluminum Industrie Actien Gesellschaft, at Neuhausen, Switzerland, and by the Société Electro-Metallurgique de France at Froges; and the Minet process, used at the works of Bernard Brothers, at Creil, France. The two former processes, and the works where they are carried on, have been fully described within the last year. The last consists in electrolyzing a mixture of sodium chloride with aluminum fluoride, or with the double fluoride of sodium and aluminum, and is being carried out successfully. The metal ordinarily sold contains two to three per cent of impurities,—generally silicon and iron,—and is usually benefitted by the presence of the former, as it adds hardness and strength. Aluminum becomes pasty at about 1,000° F., and melts at 1,300°. It loses much of its tensile strength at 400° to 500° F., at which temperature it anneals. The coefficient of linear expansion under heat when of 98.5 per cent purity is .0000206 per degree Centigrade between the freezing and boiling points of water. This nearly corresponds with the expansion of tin, which is .0000217. The specific heat is .2143, and the thermal conductivity 73.6, silver being taken as 100. Recently a way of soldering aluminum has been discovered, with hard and soft solder, and with an alloy of zinc and aluminum. The nature of the soldering fluid has not yet been published. The shrinkage of aluminum in casting is  $\frac{1}{16}$  of an inch per foot, or about 2.26 per cent of the length of the mould.

— MM. Rousson and Willems have completed the exploration of the northern extremity of the main island of Tierra del Fuego, and have communicated the results to the French Minister of Instruction (*Compte Rendu* of the Paris Geo. Soc., Nos. 7 and 8, 1891). The part referred to is bounded towards the south by a line drawn from Useless Bay to the Bay of San Sebastian. It is traversed by a chain of mountains, which rises suddenly at Cape Esquillon to a height of 1,600 feet, and terminates at Cape Espiritu Santo. The rest of the country, according to the *Scottish Geographical Magazine*, consists of great plains watered by numerous rivers, many of which dry up in summer. The most important is Rio del Oro, which flows into Philip Bay. Tierra del Fuego has a great variety of climates, but on the whole the cold is not as severe as might have been expected. The lowest temperature observed was 43° F., and the highest 69°. The nights are always cold. The barometer is subject to very sudden and considerable changes, and the winds are frequent and violent, those from the west often attaining a velocity of nearly a thousand feet per second. The Onas, who inhabit the northern part of the island, are very tall, sometimes six feet six inches, or more, in height. They are copper-colored, have oval faces and long hair plastered with clay, small eyes, prominent cheek bones, large mouths, and a few hairs on the chin. Their only clothing is a cape of guanaco or fox skin, and, sometimes, a triangular covering of leather on the head. The men occupy themselves solely in fighting with their neighbors and hunting, their chief weapons being bows and arrows tipped with pieces of glass, found on the shore, or flint. All the household labor falls on the women. Their encampments consist of circular holes, five feet in diameter and sixteen inches deep, dug out of the side of a mountain, with stakes set up round them to support a covering of skins. The Onas are not cannibals, as some travellers have asserted, nor do they burn their dead. The native population cannot be estimated at more than three hundred, but in summer the number of inhabitants is largely increased by miners, who return to Punta Arenas in winter. The

flora of the country is poor, no trees growing in the north of the island and but few shrubs. Quadrupeds are scarce, the principal being the guanaco, dog, fox, and one or two small rodents, but snipe, ducks, geese, owls, swans, and other birds are plentiful. Magnetic iron is widely distributed and in large quantities, and gold, mixed with very small garnets and rubies, is found in several places. There are also some coal seams of very poor quality, and abundance of clay suitable for the manufacture of earthenware. It is probable that the land will in time be taken up for grazing purposes. Within the last few years several small farms have been established and have yielded large returns. On Dawson Island the Jesuits have a model farm, where nearly 20,000 sheep and more than 6,000 cattle are fed.

— It is stated by *Engineering* that half the tin of the world is exported from the Malay Peninsula, where mining is carried on almost entirely by Chinese. The mining is that of flood tin, and the metal is taken from the lowlands near the mountains, where it is found in pockets ten to twenty feet or more below the surface.

— Mr. W. Mattiere Williams, in a letter to *Nature* of Oct. 1, writes as follows: "On two occasions, when proceeding northwards to Arctic Norway, I was much interested in observing the fact that the plague of mosquitoes, which is so intolerable there, especially prevails in latitudes beyond the northern range of the swallow. This may possibly be a mere coincidence, but I think it is not — an opinion strongly supported by another and very broad fact, viz., that in a given district in our own country the gnats become more abundant immediately after the departure of the swallows, martins, etc. If this view is correct, the protection of these birds should be added to the devices named in 'Dragonflies vs. Mosquitoes.'"

— On his return to Germany from Japan sixteen years ago, Professor Rein, the well-known authority on Japanese art and industry, planted in the Botanical Garden at Frankfort some specimens of the lacquer tree (*Rhus vernicifera*), from which the Japanese obtain the juice employed in the production of their famous lacquer work. According to the *London Times*, there are now at Frankfort thirty-four healthy specimens of the lacquer-tree, thirty feet high and two feet in girth a yard from the ground; and the young trees, which have sprung from the original tree's seed, are in a flourishing condition. It seems to be proved, therefore, that the lacquer-tree is capable of being cultivated in Europe, and it only remains to be seen whether the juice is affected by the changed conditions. The *Times* says that, to ascertain this, Professor Rein has tapped the Frankfort trees, and has sent some of the juice to Japan, where it will be used by Japanese artists in lacquer work, who will report on its fitness for lacquering. In the mean time, some of the most eminent German chemists are analyzing samples of the juice taken from the trees at Frankfort, and samples of the juice sent from Japan; and should their reports and the reports from Japan be favorable, it is probable that the tree will be largely planted in public parks and other places in Germany. In course of time a skilled worker in lacquer would be brought over from Japan to teach a selected number of workmen the art of lacquering wood, and in this way it is hoped that a new art and craft may be introduced into Europe.

— The disposal of sewage is a question which has been to the fore for a good many years in various countries, says *Engineering*, but which, perhaps, nowhere on the Continent has been dealt with in a more systematic manner than in Germany. In Berlin the drains from the houses receive both the rain water, the dirty water from the kitchen, etc., and the contents of the water closets, conducting them to a system of radial sewers, through which they, by a natural fall, proceed to a dozen various pumping stations within the area of the town. From these the sewage, through the medium of combined force and suction pumps, passes through pipes of three feet or still greater diameter to the land which the corporation of Berlin possesses, and where the sewage is used as a fertilizer. The sewage makes its final exit through a system of conduits so arranged that before reaching them it has parted with all its manurial power to the soil through which it is made to pass.

The sewage water thus filtered reaches the river through the natural fall of the conduits in a comparatively purified state. The sewage is an exceptionally good manure, and the yield of grass on those fields that receive it is something quite out of the common, so that it can be cut some six or seven times during one summer. This system also seems to answer well so far as the sanitary side of the question is concerned, but still there are a good many places which prefer the method by which the sewage is collected in large tanks, whereby it is possible to benefit larger areas by its fertilizing qualities. Frankfort-on-the-Maine is another German town where the sewerage system is very perfect, but owing to the excessive cost of land in that locality the sewage is not, as in Berlin, used as manure in the first instance. The sewage is purified before being allowed to escape into the Maine, and the residue is pumped into receptacles from where the farmers fetch it. The town of Hanover is also about to adopt the sewerage system on a larger scale. In Augsburg and Heidelberg the barrel system is used, much more satisfactory in the latter than in the former town. In Heidelberg the corporation itself attends to the emptying of the barrels.

— Cloud heights and velocities form the subject of a recent article by Mr. H. H. Clayton in the *American Meteorological Journal*. The paper contains the result of cloud observations made at Mr. A. L. Rotch's observatory at Blue Hill, Mass., during the past five years. The average heights of some of the principal clouds were: Nimbus, 412 metres; cumulus, base, 1,558 metres; false cirrus, 6,500 metres; cirro-stratus, 9,652 metres; cirrus, 10,135 metres. The cumulus is highest at Blue Hill during the middle of the day. The Upsala observations show that the base of the cumulus, as well as the cirrus, increases in height until evening, but neither of these conclusions apply to the observations at Blue Hill. The average velocity found for the cirrus, 82 miles an hour, is twice as great as that found at Upsala. The extreme velocity was found to be 133 miles an hour. A comparison between wind and cloud velocity shows that below 500 metres the wind velocity is less than the cloud velocity. Above that, the excess of the cloud velocity increases up to 1,000 metres, and then decreases again till about 1,700 metres, after which it steadily increases. This decrease between 1,000 metres and 1,700 metres is very probably due to the fact that the clouds between 700 metres and 1,000 metres were mostly observed during the morning, when the cumulus moves most rapidly, and that the clouds between 1,000 metres and 1,700 metres were mostly observed during the afternoon, when the cumulus moves slowest.

— Dr. Borden P. Bowie of Boston University, who has charge of the philosophical department, is now preparing a work on logic. The manuscript is nearly ready for the printers.

— Professor Conn, the head of the biology department of Wesleyan University, Middletown, Conn., has his latest book, "The New World" ready for the press, and it will be issued very soon.

— Professor George S. Bryant of the Alabama Polytechnic Institute has been appointed director of the workshop and assistant professor of mechanical engineering in the Leland Stanford, jun., University.

— Several changes have been made in the faculty of Vassar College, the following new teachers having been added: Professor J. C. Bracq, professor of French; Miss Neef, assistant in French and German; Professor J. L. Moore, professor of Latin; Miss Byrnes, assistant in biological laboratory; Miss Ballantine, director of gymnasium. Mrs. Georgia Kendrick is lady principal.

— Professor George Francis James of the University of Nashville has been appointed lecturer on literature in the University of Pennsylvania and editor of *University Extension*, the official organ of the American Society for the Extension of University Teaching. Mr. James was a student of the Northwestern and Michigan Universities and has done post-graduate work in the University of Halle, Germany, and in the Sorbonne at Paris. Two years ago he gave up the principalship of the Decatur (Ill.) high school to go to Nashville, from which position he has been called to Philadelphia.